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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/557,158	04/25/2000	Domenico Sanfilippo	2264-0321-0X	9291

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

RIDLEY, BASIA ANNA

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 10/24/2003

16

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/557,158

Applicant(s)

SANFILIPPO ET AL.

Examiner

Basia Ridley *BR*

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3 and 7-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 7-16 and 18 is/are rejected.
- 7) ☐ Claim(s) 3 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings were received on 29 July 2003. These drawings are acceptable.

Claim Objections

2. Claims 3 and 17 are objected to because the dependency of claim 3 is not clear.

Accordingly claim(s) 3 and 17 have not been further treated on the merits.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim(s) 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim(s) 18 recite(s) the limitation(s) "the content of chromium trioxide in the catalyst" and "the content of potassium oxide in the catalyst". There is insufficient antecedent basis for said limitation(s) in the claim(s), as neither of the preceding claims, which claim 18 is dependent from, positively recites a catalyst comprising chromium trioxide and potassium oxide.

Claim Rejections - 35 USC § 102 or 35 USC § 103

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim(s) 7-13 are rejected under 35 U.S.C. 102(b) as anticipated by, or, in the alternative, under 35 U.S.C. 103(a) as being obvious over Dickinson (USP 2,602,809).

Regarding claim(s) 10-13, Dickinson, in Fig. 1, disclose(s) similar process for production of synthesis gas comprising the steps of:

- partially oxidizing or autothermally reforming light hydrocarbon (9) with chromium oxide catalyst, supported on an inert carrier and modified with an alkali or alkaline-earth metal, as the light hydrocarbon (9) contacts the catalyst and extracts oxygen therefrom thereby being partially reduced and the chromium oxide catalyst being capable of autonomously sustaining the catalytic partial oxidation reaction by means of redox cycle (C9/L39-C10/L52); and
- re-oxidizing the chromium oxide by means of air (C4/L20-24) in a reactor (31) maintained at a temperature which is substantially equal to or lower than that present in the reactor where the partial oxidation occurs (C5/L22-42 and C6/L37-55); wherein
- the light hydrocarbon is methane, ethane, liquefied petroleum gas, refinery gas or naphtha (C4/L29-47); and
- the light hydrocarbon is methane (C4/L29-47).

Dickinson teaches chromium oxide catalyst bed that appears to be the same as, or an obvious variant of the hexavalent chromium oxide catalyst set forth in the instant claims. Since Dickson discloses that the chromium oxide catalyst can be used in the process, as set forth above,

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and that said catalyst is cyclically oxidized and reduced in said process (Fig. 1), it would be inherent that at least some of the chromium oxide in the process would be oxidized to the hexavalent chromium oxide and reduced to Cr_2O_3 . Additionally, the reference is not limited to any specific chromium oxide and since it is known that hexavalent chromium oxides can be used in oxidation reactions for production of synthesis gas as a source of oxygen, it would have been obvious to use said hexavalent chromium oxide in the process of Dickinson.

Regarding claim(s) 7-9, Dickinson disclose(s) all of the claim limitations as set forth above. Additionally the reference discloses the process further comprising the steps of:

- feeding the carbon containing material (14) to a first fluid bed partial oxidation reactor (13) containing solid comprising chromium oxide;
- discharging product gas stream (18) from the head of the first reactor (13);
- collecting a solid containing lower chromium oxide from the bottom of the first reactor (13) and feeding the collected solid (21) to a second fluid bed regeneration reactor (31) maintained at a temperature substantially equal to or lower than that present in the oxidation reactor maintained at a temperature substantially equal to or lower than the temperature of the oxidation reactor (C5/L22-42 and C6/L37-55);
- feeding a stream of air at high temperature to the bottom of the second regeneration reactor (C4/L20-24, Fig. 1); and
- recycling the regenerated solid (33) to the first oxidation reactor (13); wherein
- in the first fluid bed oxidation reactor a temperature ranging from 800 to 1100°C is maintained, together with a pressure ranging from 0.5 to 5 MPa (C5/L22-42); and wherein
- in the second regeneration reactor the same operating conditions present in the first reactor are substantially maintained (C5/L22-42 and C6/L37-55).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim(s) 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickinson (USP 2,602,809).

Regarding claim(s) 14-15, Dickinson disclose(s) all of the claim limitations as set forth above. Additionally the reference discloses the process wherein:

- the inert carrier of the catalyst is alumina modified by the addition of silica thereto (C9/L50-C10/L27); and wherein
- 0.1 to 10% by wt of silica is added thereto (C9/L50-C10/L27).

While Dickinson does not explicitly disclose the specific size of alumina particles, the size of alumina particles is not considered to confer patentability to the claims. As the catalyst properties are variable(s) that can be modified, among others, by adjusting the size of alumina particles, the precise size of alumina particles would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed size of alumina particles cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the size of alumina particles in the process of Dickinson to obtain desired balance catalyst properties (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are

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disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

10. Claims 16 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Dickinson (USP 2,602,809) in view of Kmecak et al. (USP 3,965,252).

Regarding claims 16 and 18 Dickinson disclose(s) all of the claim limitations as set forth above. Additionally Dickinson discloses the process wherein the oxygen carrying contact material is present in the range from 1 to 30 wt % (C9/L74-C10/L8) and that said catalyst is promoted with a material having a beneficial effect on the gasification reaction, such as barium oxide, titania, thorium, manganese oxide, or magnesia oxide (C10/L28-52), but the reference does not disclose said material comprising potassium oxide. Since the promoters comprising from 1 to 10 wt % of a Group I metal, such as potassium, rubidium, cesium, etc., a Group II metal, such as calcium, magnesium, strontium, etc., a rare earth metal, such as cerium, thorium, etc., are equivalent promoters (as evidenced by Kmecak et al., C4/L32-56) it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace promoter of Dickinson with promoter comprising potassium oxide, since substitution of known equivalent structures is generally recognized as being within the level of ordinary skill in the art. Doing so would amount to nothing more than use of a known material for its intended use in a known environment to accomplish entirely expected result.

11. Claim(s) 7-13 are rejected under 35 U.S.C. 103(a) as being obvious over Dickinson (USP 2,602,809) in view of Rooks et al. (USP 4,367,160) or Cole (USP 6,007,699).

Regarding claim(s) 10-13, Dickinson, in Fig. 1, disclose(s) similar process for production of synthesis gas comprising the steps of:

- partially oxidizing or autothermally reforming light hydrocarbon (9) with chromium oxide

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catalyst, supported on an inert carrier and modified with an alkali or alkaline-earth metal, as the light hydrocarbon (9) contacts the catalyst and extracts oxygen therefrom thereby being partially reduced and the chromium oxide catalyst being capable of autonomously sustaining the catalytic partial oxidation reaction by means of redox cycle (C9/L39-C10/L52); and

- re-oxidizing the chromium oxide by means of air (C4/L20-24) in a reactor (31) maintained at a temperature which is substantially equal to or lower than that present in the reactor where the partial oxidation occurs (C5/L22-42 and C6/L37-55); wherein
- the light hydrocarbon is methane, ethane, liquefied petroleum gas, refinery gas or naphtha (C4/L29-47); and
- the light hydrocarbon is methane (C4/L29-47).

Dickinson teaches chromium oxide catalyst bed wherein said catalyst is cyclically oxidized and reduced in said process (Fig. 1). Additionally, while Dickinson does not explicitly disclose said chromium oxide being a hexavalent chromium oxide, the reference is not limited to any specific chromium oxide and further the reference discloses that natural occurring ores are particularly suitable for use in the process (C9/L74-C10/L3). Since it was well known in the art at the time of the invention that hexavalent chromium oxides either by themselves or as part of a naturally occurring ores can be used in oxidation reactions for production of synthesis gas as a source of oxygen, as evidenced by Rooks et al. (C2/L33-41) or Cole (C8/L62-C9/L9), and, since the instant specification is silent to unexpected results, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use hexavalent chromium oxide as a chromium oxide catalyst in the process of Dickinson. Doing so would amount to nothing more than use of a known material for its intended use in a known environment to accomplish entirely expected result.

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Regarding claim(s) 7-9, Dickinson in view of Rooks et al. or Cole, disclose(s) all of the claim limitations as set forth above. Additionally Dickinson discloses the process further comprising the steps of:

- feeding the carbon containing material (14) to a first fluid bed partial oxidation reactor (13) containing solid comprising chromium oxide;
- discharging product gas stream (18) from the head of the first reactor (13);
- collecting a solid containing lower chromium oxide from the bottom of the first reactor (13) and feeding the collected solid (21) to a second fluid bed regeneration reactor (31) maintained at a temperature substantially equal to or lower than that present in the oxidation reactor maintained at a temperature substantially equal to or lower than the temperature of the oxidation reactor (C5/L22-42 and C6/L37-55);
- feeding a stream of air at high temperature to the bottom of the second regeneration reactor (C4/L20-24, Fig. 1); and
- recycling the regenerated solid (33) to the first oxidation reactor (13); wherein
- in the first fluid bed oxidation reactor a temperature ranging from 800 to 1100°C is maintained, together with a pressure ranging from 0.5 to 5 MPa (C5/L22-42); and wherein
- in the second regeneration reactor the same operating conditions present in the first reactor are substantially maintained (C5/L22-42 and C6/L37-55).

12. Claim(s) 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickinson (USP 2,602,809) in view of Rooks et al. (USP 4,367,160) or Cole (USP 6,007,699).

Regarding claim(s) 14-15, Dickinson in view of Rooks et al. or Cole, disclose(s) all of the claim limitations as set forth above. Additionally Dickinson discloses the process wherein:

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- the inert carrier of the catalyst is alumina modified by the addition of silica thereto (C9/L50-C10/L27); and wherein
- 0.1 to 10% by wt of silica is added thereto (C9/L50-C10/L27).

While Dickinson does not explicitly disclose the specific size of alumina particles, the size of alumina particles is not considered to confer patentability to the claims. As the catalyst properties are variable(s) that can be modified, among others, by adjusting the size of alumina particles, the precise size of alumina particles would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed size of alumina particles cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the size of alumina particles in the process of Dickinson to obtain desired balance catalyst properties (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

13. Claims 16 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Dickinson (USP 2,602,809) in view of Rooks et al. (USP 4,367,160) or Cole (USP 6,007,699) and further in view of Kmecak et al. (USP 3,965,252).

Regarding claims 16 and 18 Dickinson in view of Rooks et al. or Cole, disclose(s) all of the claim limitations as set forth above. Additionally Dickinson discloses the process wherein the oxygen carrying contact material is present in the range from 1 to 30 wt % (C9/L74-C10/L8) and that said catalyst is promoted with a material having a beneficial effect on the gasification reaction, such as barium oxide, titania, thoria, manganese oxide, or magnesia oxide (C10/L28-52),

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but the reference does not disclose said material comprising potassium oxide. Since the promoters comprising from 1 to 10 wt % of a Group I metal, such as potassium, rubidium, cesium, etc., a Group II metal, such as calcium, magnesium, strontium, etc., a rare earth metal, such as cerium, thorium, etc., are equivalent promoters (as evidenced by Kmecak et al., C4/L32-56) it would have been an obvious to one of ordinary skill in the art at the time the invention was made to replace promoter of Dickinson with promoter comprising potassium oxide, since substitution of known equivalent structures is generally recognized as being within the level of ordinary skill in the art. Doing so would amount to nothing more than use of a known material for its intended use in a known environment to accomplish entirely expected result.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Response to Arguments

15. Applicant's arguments filed on 29 July 2003 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. In view of the foregoing, none of the claims are allowed.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (703) 305-5418. The examiner can normally be reached on Monday through Thursday, from 9:00 AM to 7:30 PM.

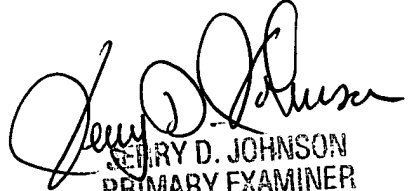
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (703) 308-6824.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Basia Ridley
Examiner
Art Unit 1764


JERRY D. JOHNSON
PRIMARY EXAMINER
GROUP 1100

BR
October 20, 2003